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Informal Monthly Progress Report No. 8

for the period

7 August 1955 to 4 September 1955

25X1A5a1


System No. 1

25X1A5a1
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1.0 ANTENNAS

Sample reflectors have been received for S and X frequency bands. The S-band dish has been tested and approved. Delivery is to begin during the week of September 5. The original delivery schedule was to have begun during mid-August. Completed antennas can be made ready for shipment within a day or two after delivery from the vendor.

2.0 INFORMATION AMPLIFIER

Six amplifiers are ready for delivery upon receipt of the redesigned cover and can assembly on September 6.

Two hundred printed boards for the amplifier are out on bid to several vendors.

Environmental tests (to be discussed separately) dictated some rework on the power supply can. This amounts to soldering hermetically-sealed connectors to a thin steel plate and securing the plate to the aluminum can with a combination gasket-adhesive seal. These changes were also incorporated into the amplifier can. A visual inspection did not provide a reliable check on the sealing of the connectors to the aluminum can.

Two of the reworked units will be ready for delivery during the week of September 5.

3.0 INFORMATION RECORDER

One recorder, including the electronics, is essentially complete and is undergoing tests. The preliminary tests have given added confidence in the friction-type capstan drive. It may be necessary to use ball-bearings throughout the capstan drive assembly. Design details regarding "hot-spot" temperatures for the use of ball bearings have not been worked out.

Extensive efforts are being made to deliver this unit by September 12, 1955, although the nature of the item and the questions to be answered make it impossible to establish a definite date.

4.0 TEST SET

The first production test set was constructed, and troubleshooting is complete, except for the oscilloscope horizontal amplifiers.

The construction of the second test set is about 35% complete. Certain construction details have been changed in this

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unit to make the circuits more accessible and to improve the general appearance of the equipment.

5.0 ENVIRONMENTAL TESTS

The information amplifier and vibrator power supply were given vibration, shock, and altitude tests. A standard MIL Spec. vibration test was made at 10 G through frequencies up to 500 cycles. The shock tests consisted of nine drops each at 15 G. The altitude tests were made with the equipment operating at 80,000 feet.

The shock tests caused no damage to either unit.

The altitude tests caused no damage to either unit, and the operation of the equipment was normal at 80,000 feet.

The amplifier can is not a rigid enclosure due to the necessity of keeping the weight to a minimum. A small breather plug is designed into the can to equalize the pressure.

One altitude test was made with this breather plug sealed. One of the connectors broke the soldered seal holding it to the can. For this reason, all connectors requiring solder for a mechanical connection are being silver soldered to a thin steel plate.

All altitude tests were made in an atmosphere sufficiently humid to cause considerable condensation, and the breather plug on the amplifier can was covered with a wet cloth.

The vibration tests on the amplifier caused 17 broken leads on capacitors. The amplifier can caused severe mechanical amplification of the vibrations. The unit quit operating after 30 minutes vibration at the mechanical resonant frequency of 360 cps.

Broken leads can be prevented by using snug leads without bends when mounting the part to the printed board. In addition, the redesigned can is more rigid. The amplifier with the new can will be subjected to another vibration test.

The power supply failed early in the vibration tests.

Five component leads and an instrument fuse were broken. The causes and cures are similar to those found in the amplifier.

One mounting bracket also fractured and is being redesigned.

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6.0 FLIGHT TESTS

Three flight tests were made using the X-band equipment. These flights were made on August 13, August 16, and August 24. Some random data was obtained but no sources were located.

Further tests using the X-band equipment must be made with the cooperation of a known signal source.

A flight test was made on August 26 to determine the maximum range at which the System 1 equipment could record signals from a ground source. The maximum altitude of the aircraft was 40,000 feet.

Due to the existence of restricted areas off the coast, the calculated maximum ranges could not be checked. The next available range beyond 135 nautical miles was 245 nautical miles. This is in the vicinity of the radio horizon at 40,000 feet, and the main beam of an AN/CPS-6B transmitter is tilted approximately 1.5° above the horizontal.

No data was received at the range of 245 nautical miles.

The return flight path was made to pass within 30-100 nautical miles of two other sources in the vicinities of Mill Valley, California, and Mather AFB, California.

There was solid reception from both sources. As many as three simultaneous sources were identified from the playback of the recorded tape.

7.0 PACKAGING FOR SHIPMENT

Rather simple packing for domestic shipping is being used. The units in general will be moisture sealed and packed with a filler in cardboard cartons. A special protective carton will be made for the antennas. The recorders will be double-packed. The Ampex transcription equipments will be packed in their original cartons. The test set will be crated using shock mounting.

8.0 TRAINING PROGRAM

One engineer received concentrated training and troubleshooting practice for about ten days. The engineer will receive a final check-out when production units are ready for delivery.

One technician has received training consisting of classroom lectures, practical trouble-shooting, operation of prototype equipment, and observation of construction techniques.

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9.0 MAN-HOURS

A total of 6290 man-hours have been expended during this reporting period.

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